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MACKENZIE VALLEY PIPELINE INQUIRY

Accumulative Impacts of Delta Developments on Wildlife

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Education and Experience

Education

My university education began at the University of Victoria in Victoria, B.C. where I received a B.Sc. degree in biology. I studied for my M.Sc. at Carleton University in Ottawa, the topic of my thesis centering on the habitat selection of small mammals. My experience in the arctic began in 1967 when I started a Ph.D. thesis on the food ecology and hunting behaviour of denning arctic foxes. The study took place in the central District of Keewatin, a low arctic tundra biome. After completing this research in 1970 I joined the IBP Research Study on Devon Island where I studied the ecology of lemmings in this high arctic tundra biome during the summer of 1971.

Experience

In the spring of 1972 I joined the Canadian Wildlife Service as a wildlife biologist. During the two years and nine months I worked for the organization I lived in Whitehorse and Yellowknife. I served as the wildlife advisor to the Department of Indian and Northern Affairs on the Land Use Advisory Committees of both Territories and the Arctic Waters Oil and Gas Advisory Committee in Yellowknife.

In dealing with the responsibilities of mitigating the impacts of all types of development activities on birds and mammals throughout both Territories, I relied heavily on the expertise of northern research scientists and biologists. My experience with activities associated with northern exploration and development operations was gained from practical experience and frequent communication with industry representatives and government resource managers. The advice and recommendations I prepared were based on these inputs plus my own experience in the north.

In January 1975 I joined the Environmental Assessment Section of the Department of Indian and Northern Affairs. I have been closely associated with reviews of all submissions provided by the three Mackenzie Delta Gas Development proponents. I am also familiar with the Mackenzie Valley Pipeline proposal through the Delta and the Canmar offshore drilling proposal.

Publications

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Introduction

My assignment to this Inquiry is to provide evidence concerning the effects of all developments proposed for the Mackenzie Delta and adjacent regions and their accumulative impacts on wildlife. I am aware that evidence has been presented earlier on the characteristics of the wildlife species which occur in the Mackenzie Delta and that descriptions of the various proposed

developments have also been given along with assessments of the magnitudes of the various types of impacts that can be expected on various species of wildlife.

For the record the developments which I wish to include are:

- (a) Mackenzie Valley Pipeline.
- (b) Three proposed Gas Development Systems;
- (c) Onshore exploratory drilling.
- (d) Nearshore (artificial island) exploratory drilling.
- (e) Offshore (drilling ship) exploratory drilling.
- (f) Dempster Highway completion.
- (g) Proposed Inuvik to Tuktoyaktuk Highway.

I shall not attempt to describe all of the impacts to wildlife which may occur nor shall I attempt to rate the magnitudes of these impacts. Rather I wish to draw to your attention some of the major disruptions to wildlife which are, in my opinion, either unavoidable or inevitable. I also wish to provide some recommendations which I believe could mitigate these impacts, as well as some considerations for future wildlife management in the Delta and adjacent regions.

Impacts to Wildlife

Aircraft

A great deal has been said about aircraft activities that will be associated with pipeline construction and the types and magnitudes of impacts that can be expected for various wildlife

species. But a lot has been left unsaid in relation to what is predicted in aircraft activity and what actually takes place. In my experience with onshore and nearshore petroleum exploration, aircraft activity associated with drilling and seismic operations tends to run in an organized, consistent manner due to the northern experience gained by the contractors. Despite this experience, accidents, breakages, forgotten equipment, visits by company officials, not to mention government inspectors and officials, contribute significantly to the level of aircraft activity.

During construction of the pipeline, summer pipelining operations and construction of the Shell and Imperial gas plants will add to the aircraft requirements for ongoing onshore and nearshore exploratory operations in the outer Delta. The contractors and subcontractors for the major developments will be for the most part inexperienced with northern conditions, and, faced with time and financial constraints and very limited access to the project sites, they cannot be expected to co-operate extensively on the co-ordination of transportation facilities. Furthermore, the petroleum companies cannot be expected to co-ordinate either inter-company or intra-company aircraft transportation on projects of this scale.

In short I expect a proliferation of aircraft in the Delta on full time charter to project contractors. Additional aircraft will be demanded to satisfy government inspectors and officials not to mention parties indirectly associated with or curious about the development projects.

In my opinion the activities of waterfowl populations in the outer Delta could be seriously disrupted by such aircraft. Aircraft operating out of Shell's Farewell Camp; the Niglintgak plant and associated well pads and dock; the Taglu airstrip and dock; and the camps and pipelining operations in the Shallow Bay area will affect nesting, brood rearing, moulting, feeding and staging waterfowl.

All the proponents have suggested that air corridors and flight elevations should be established to minimize aircraft disturbance. No doubt these will help for flights directly associated with company projects. But, what of the multitude of unrelated company flights? What agency or body will be responsible for establishing a master plan for air corridors for all projects and what agency or body will police it?

One final consideration; a pilot's first responsibility is always to his passengers and aircraft and when faced with uncertainties such as weather or heavy air traffic he will, if necessary, break regulations. For example, foggy conditions prevail in the Delta in May, early June, as well as during fall. Aircraft can legally operate in fog and land under low cloud conditions given adequate landing site and aircraft instrumentation. However, under low cloud conditions and heavy air traffic there are few living light-aircraft pilots who will obey a regulation for 1,500 ft. ceiling in a waterfowl nesting area when the ceiling is only 500 feet. In other words, there is a conflict between air traffic regulations and operating recommendations established to protect wildlife. There is a requirement for the co-ordination of all aircraft activities throughout the Mackenzie Delta and adjacent regions and the establishment of air traffic regulations which incorporate wildlife interests.

Air Cushion Vehicles

The operations of air cushion vehicles in areas occupied by waterfowl populations is also a potential problem requiring co-ordination and regulation. The high speed, versatility and operating noise level of these vehicles over deep and shallow

water and lowlying floodplain terrain creates potential conflicts with waterfowl activities throughout the Delta. Within migratory bird sanctuaries operations of these vehicles can be regulated under existing legislation. However, outside of the Kendall Island Sanctuary, critical waterfowl habitat exists where the operating conditions for these vehicles can only be recommended rather than regulated, to protect wildlife interests.

To date, I personally am not aware of any complaints concerning waterfowl/air cushion vehicle interaction. However, I am concerned that a number of these vehicles will increase during construction operations and I believe that operation corridors and regulations should be developed to prevent any future problems.

Hydrocarbon Pollution

Information has been provided on fuel quantities, storage locations, risks of spills in the Delta and the various consequences for local wildlife. For the sake of convenience, hydrocarbon pollution can be divided up into three categories: an uncontrolled oil blowout at an offshore well; a major fuel-oil spill - e.g. the magnitude of a fuel barge rupture or the equivalent of a 100,000 gal. plus tank burst; and finally a minor fuel spill. I do not wish to enter discussions of the statistical probability of such

pollution occurring, however, I do wish to outline the potential threats to wildlife and to outline my assessment of the effectiveness of contingency planning and equipment.

The uncontrolled blowout of an oil well in the offshore or nearshore areas of the Beaufort Sea will in my opinion have a catastrophic effect on regional seabird and waterfowl populations. The report - Offshore Drilling for Oil in the Beaufort Sea: A Preliminary Environmental Assessment - provides, in my opinion, a valid, comprehensive assessment of both the impacts of such a blowout and the lack of effectiveness of the contingency plan and equipment to control such a blowout.

In the outer Delta region, in the area of Kendall Island, the threat of fuel-oil pollution to waterfowl will increase significantly with the proposed development of the Niglintgak and Taglu gas plants. The dock unloading sites lie on Kumak and Kuluarpak Channels respectively, within 12 miles of Kendall Island. These are both major channels which discharge south of Kendall Island, either side of smaller deltaic islands used by Snow Geese and other waterfowl as nesting, feeding, brood rearing and moulting areas. If a major fuel-spill occurred in either of these channels it is doubtful if sufficient fuel spill containment and cleanup equipment could be mobilized and placed in operation before the bulk of the

spill entered this area. Such a spill would have its greatest adverse effect upon birds during summer, when nesting and feeding areas would be polluted and the birds themselves would be contaminated.

Similar threats to waterfowl feeding and staging habitats exist in the Shallow Bay area where fuel storage sites for pipeline construction are planned.

The effectiveness of oil spill contingency plans are only as good as the equipment, manpower training and logistics of which they are composed. At present the environmental conditions and isolation of the Mackenzie Delta-Beaufort Sea region provide insurmountable obstacles to the effective control and cleanup of major oil or fuel spills. These obstacles include minimal amounts of facilities, equipment and manpower to cleanup spills and limited transportation opportunities compared with areas in southern Canada or the United States.

In the Delta, the Arctic Petroleum Operators Association have organized the stockpiling of petrochemical-spill contingency equipment and undertaken manpower training to develop what is known as the Delta Environmental Protection Unit. However,

contingency planning for the Unit is not co-ordinated for the various seasonal operations which occur in the Delta. Rather it is the responsibility of each individual company to develop a contingency plan for its particular operations.

It is also important to note that the Delta Environmental Protection Unit will serve not only ongoing exploration operations but also the Canmar offshore drilling operation, the three gas development plants and presumably the pipeline construction. Each of the gas development proposals indicate that the Unit will be associated with their operations, however, the development of equipment, manpower and logistic features and the co-ordination of contingency planning remain unknown.

Population Expansion and Tourism

I wish to bring to your attention a concern for regional Delta wildlife populations which has not been discussed in any depth at this Inquiry. This is the impact on wildlife of the expansion and redistribution of human population, and the potential expansion of the tourist industry in the Mackenzie Delta area.

Construction of the three gas processing plants, pipelaying operations across Delta channels and the annual barge resupply operations will involve a much larger number of workmen in the region during summer than has been experienced to date. The disturbance of wildlife by workmen associated with petroleum exploration has not been a serious problem due to the large proportion of winter operations, and the inhospitable conditions and low population levels of wildlife during winter. In my opinion the level of disturbance will increase significantly when major construction begins, especially if small boats and vehicles are made available for recreational purposes.

Another observation concerns the activities of workmen during their extended leave periods. In Alaska many pipeline workers fly home to their families while the remainder stay in Fairbanks or Anchorage, both of which are large cities experiencing difficulties with the transient population. If Inuvik is subjected to this transient population pressure, many workmen will take advantage of local transportation opportunities during summer to quote "see the country" or participate in local fishing and non-resident hunting opportunities.

Workmen wandering about in the construction sites or sight-seeing in the Delta region will contribute to the disturbance of wildlife habitats and populations. In the Delta, development will likely go on for many years, if nearshore and offshore exploration continues to be successful. Construction workers will continue to be required, consequently this element of disturbance can be expected to persist in varying degrees for many years to come.

It is a foregone conclusion that the establishment of suppliers to service pipeline and gas plant construction operations will introduce a large number of temporary residents to Inuvik and other Delta communities. In addition, the manpower requirements for operation of the pipeline facilities and gas processing plants will increase the number of permanent workers and their families living in Inuvik. The contribution of these people plus federal and territorial personnel associated with the administration of the resources and communities will significantly increase the population in the Delta region. These temporary and permanent community residents will take advantage of regional recreational opportunities, especially during summer. Small boat travel to the outer Delta for fishing, sightseeing and hunting opportunities will significantly increase. Critical wildlife habitat will be subjected to limited disturbance but more

importantly, wildlife species populations will be subjected to recurrent disturbance. In this regard, special consideration must be given to the persistent disturbance of waterfowl populations in critical habitats throughout the summer and hunting pressure on Snow Geese during the important fall staging period. Also, the Porcupine Caribou Herd in the Richardson Mountains and the Blue Nose Herd in the Anderson River area will receive increased pressure from hunters taking advantage of the completion of the Dempster Highway and relatively cheap aircraft charters out of Inuvik.

At present the tourist industry in the N.W.T. is limited by the lack of cheap transportation. Despite this the number of tourists per annum has increased from 600 to 20,000 persons between 1959 and 1972.

In my opinion the completion of the Dempster Highway and the construction of a highway between Inuvik and Tuktoyaktuk will open the Delta region to extensive tourist pressure. The highway offers a unique opportunity in Canada to drive north of the Arctic Circle and to dip the wheels of one's vehicle into the Arctic Ocean. The development of the gas pipeline and gas processing facilities in the Delta, the unique wildlife and other environmental

interests of the region will doubtless also attract sight-seers. Those interested in the environment or development of the Delta will create a demand for aircraft and boat transportation. Also, many tourists will wish to hike or travel extensively by canoe or small power boat throughout the region. A highway link to Tuktoyaktuk will also provide relatively easy access to regions east of the Delta such as Eskimo Lakes, Liverpool Bay and Cape Bathurst.

The various pressures on wildlife species that will result from increased population and tourism in the Delta appear insignificant in themselves, but when they are accumulated and evaluated in view of the potential for future expansion of development in the region, the problems will, in my view, quickly become the most difficult for wildlife managers to solve.

Mitigation of Impacts and Management Recommendations for Wildlife

In consideration of the major impacts to wildlife that I believe will result from aircraft and hovercraft activities, hydrocarbon spills and increased population and tourism, I wish to suggest some recommendations which will mitigate these impacts through the development of improved operating conditions and management of wildlife.

Operating Conditions

Regarding the operations of aircraft in areas occupied by wildlife, I indicated earlier that the problem of aircraft controls stems from the inconsistency between air traffic regulations and recommendations to protect wildlife interests. There is therefore the requirement to develop regional air traffic regulations which afford wildlife the maximum protection. It is possible that such protection could be provided through a Notice to Airmen or NOTAM issued by the Ministry of Transport. This notice system is used either to eliminate or control aircraft activity in a defined airspace for a specific time interval. I believe that regulations through this authority could be developed to effectively protect wildlife interests in the Delta. However, the full co-operation of industry, wildlife agencies and aircraft operators should be enlisted in the establishment of such regulations.

Similar regulations to protect wildlife from air cushion vehicle activities may be established through the Canada Shipping Act or Notice to Mariners administered by the Ministry of Transport.

In reference to the contingency planning and equipment, manpower training and logistics associated with oil blowouts and major fuel spills, I have three recommendations to make.

1. That more research and development be undertaken to improve the effectiveness of oil spill control and cleanup equipment under Arctic climatic conditions, especially those which occur in the Mackenzie Delta and Beaufort Sea.
2. That the operating specifications of newly-developed oil spill equipment, logistics and manpower training are proven to be feasible under the climatic conditions in which they are specified to operate.
3. That contingency planning be organized on an inter-development basis involving all development activities within the Delta area.

Wildlife Management in the Delta

Up until now, petroleum exploration and the associated increase in population in the Mackenzie Delta have resulted in minimal habitat losses and disturbance of wildlife populations. However, at this point in time, faced with prospects of a massive increase in hydrocarbon development, continued petroleum exploration, and a major population expansion resulting from such developments and the tourist industry, it is time for wildlife management authorities to exert greater controls for the protection of wildlife habitat, to minimize disturbances and to maintain

the present level of productivity. The use of wildlife habitats by industry is already regulated by government but we must expect that industry will soon require full control of some tracts of land which include critical habitats. Wildlife managers must have the information necessary to estimate the species production losses that will result from the removal of these habitats and, if necessary, seek compensation for the losses, such as the development of new habitats in the region, or financial incentives to increase the productivity of the affected species elsewhere.

Controls of human activities in critical wildlife habitats will also be required. These will likely include controls on hunting bag limits, the timing of hunts or the areas where hunting is permitted. The boundaries of existing wildlife areas may have to be changed and numbers of people and their activities in critical habitats may have to be curtailed. In many cases regulations can be established under existing legislation to satisfy these requirements, whereas in other areas special status under legislation such as National Parks or the Canada Wildlife Act may be required.

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